Figure 1: The transcoding system adapts the multimedia content to the capabilities of the client devices by analyzing the content, selecting from the content and transcoding alternatives, and transcoding the content accordingly.
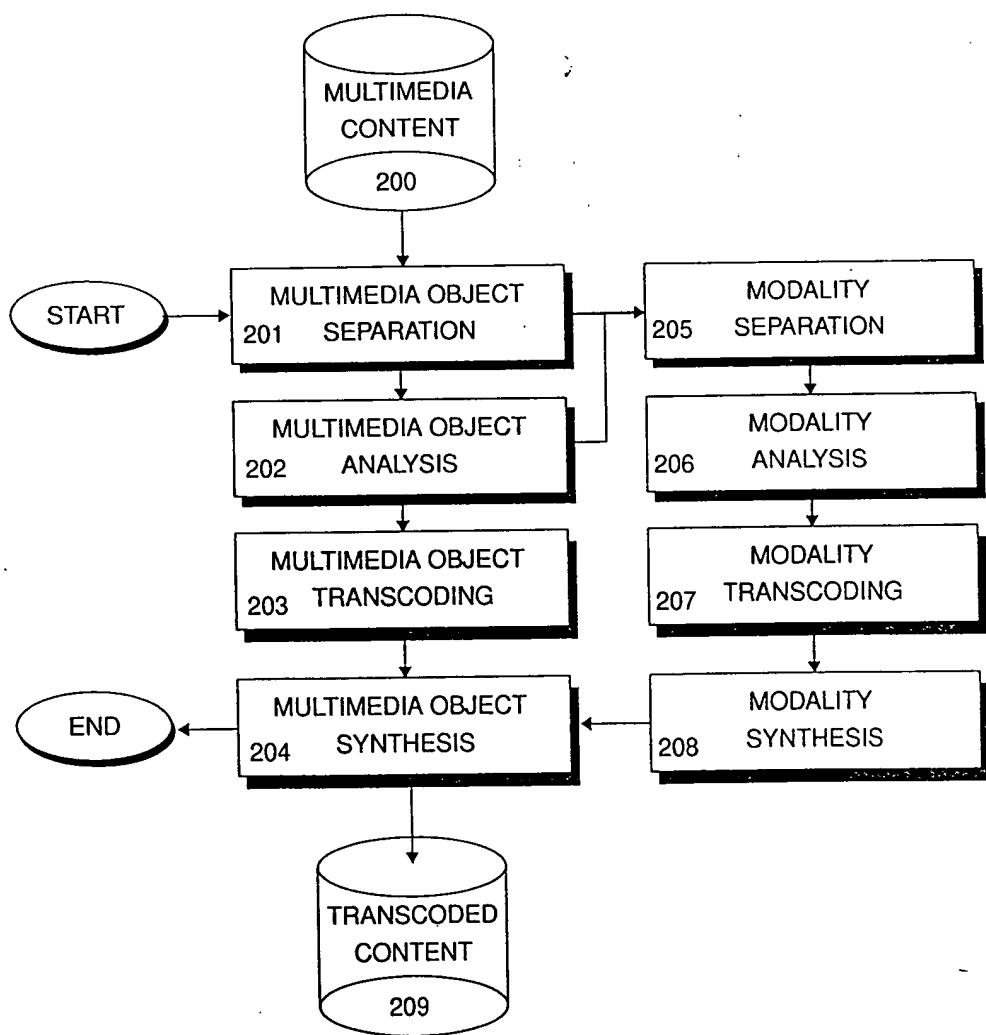
Figure 2: The multimedia content can be separated into individual multimedia objects. Each of the multimedia objects can be separated into constituent modalities. Content analysis and transcoding can then be performed on the individual multimedia objects or modalities independently.
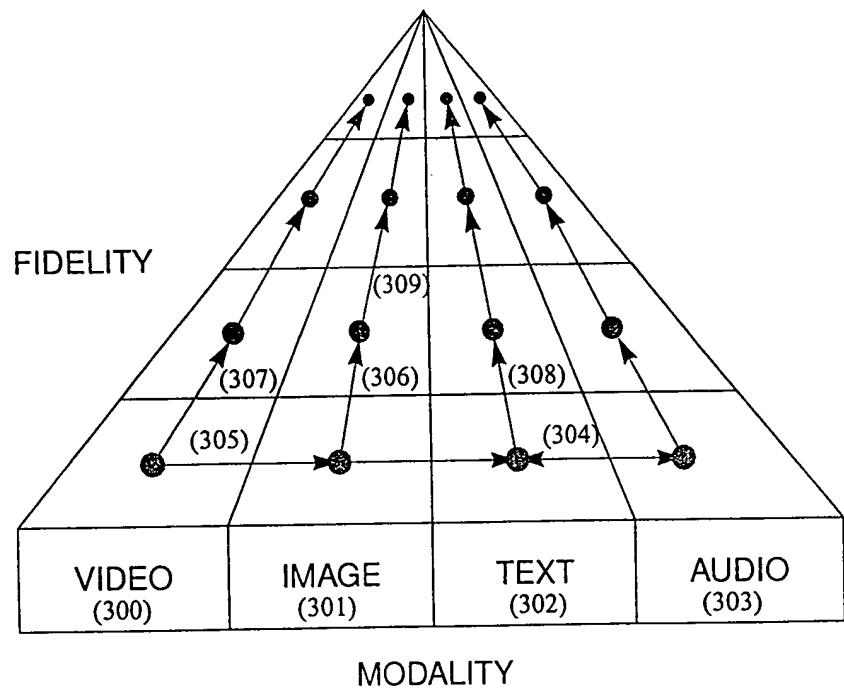
Figure 3: The multiple representations of a multimedia object can be organized into a pyramidal structure. The cells correspond to the different representations of the object using particular modalities and fidelities. The arrows indicate examples of transcoding paths that perform summarization (vertical arrows) and translation (horizontal arrows).
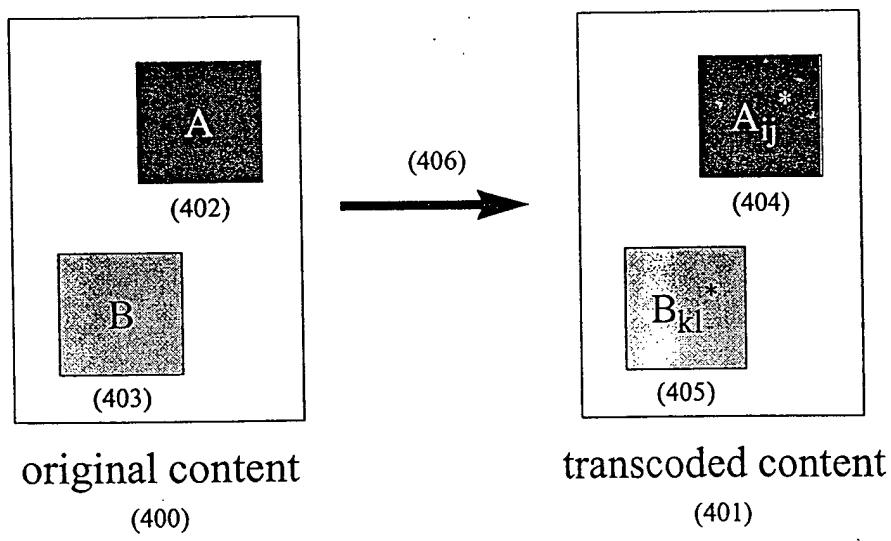
Figure 4: Example of content selection for a multimedia document consisting of two multimedia objects A and B, where A_{ij} is an object with modality i and fidelity j, and B_{kl} is an object with modality k and fidelity l.
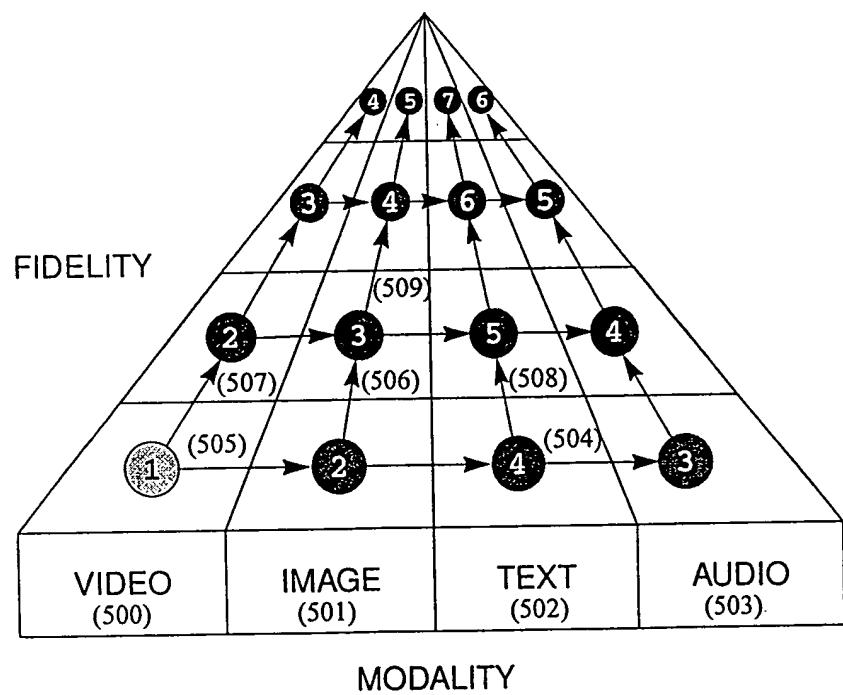
Figure 5: Content value scores indicate the relative content values of the alternative versions of a full-resolution video (high score = 1, low score = 7).
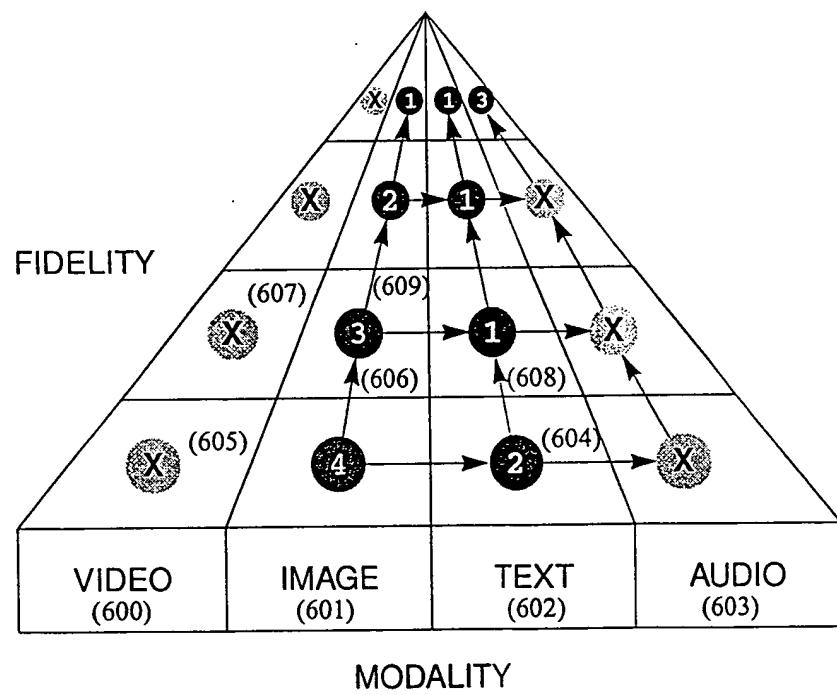
Figure 6: Content preference scores indicate the relative preference of the alternative versions of a full-resolution video.

Multimedia document (700)

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(701) **Image types**

(702) **Image purposes**
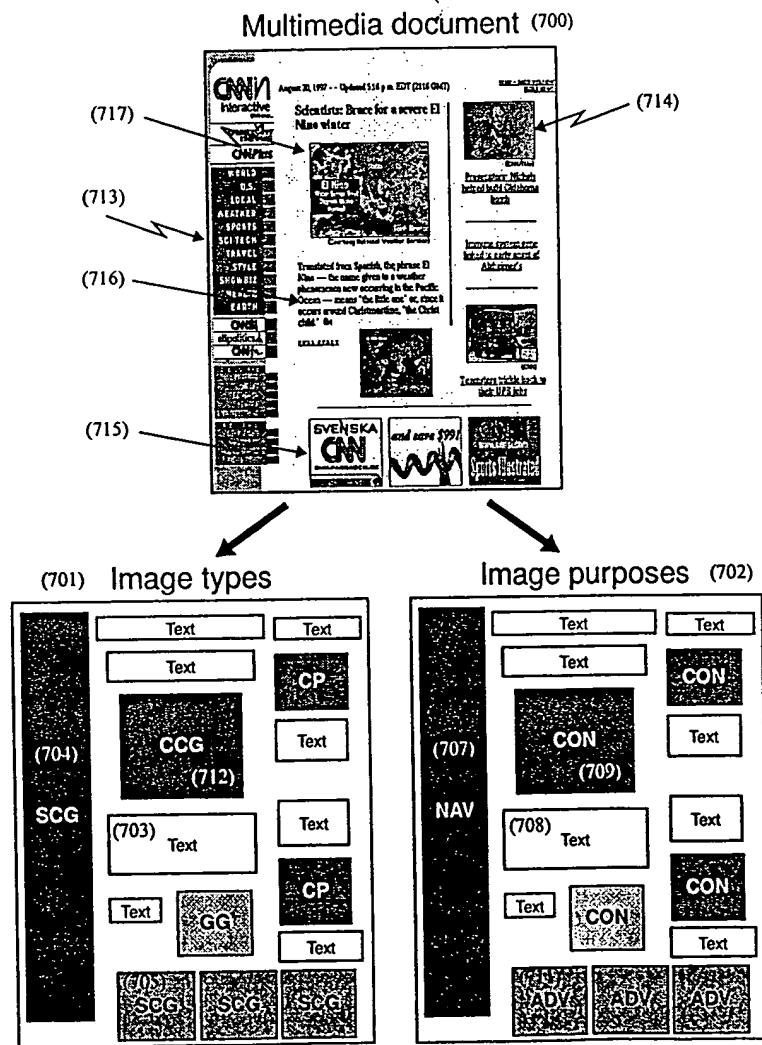
Figure 7: Example labeling of the image *type* and *purpose* classes of the images in a multimedia document.
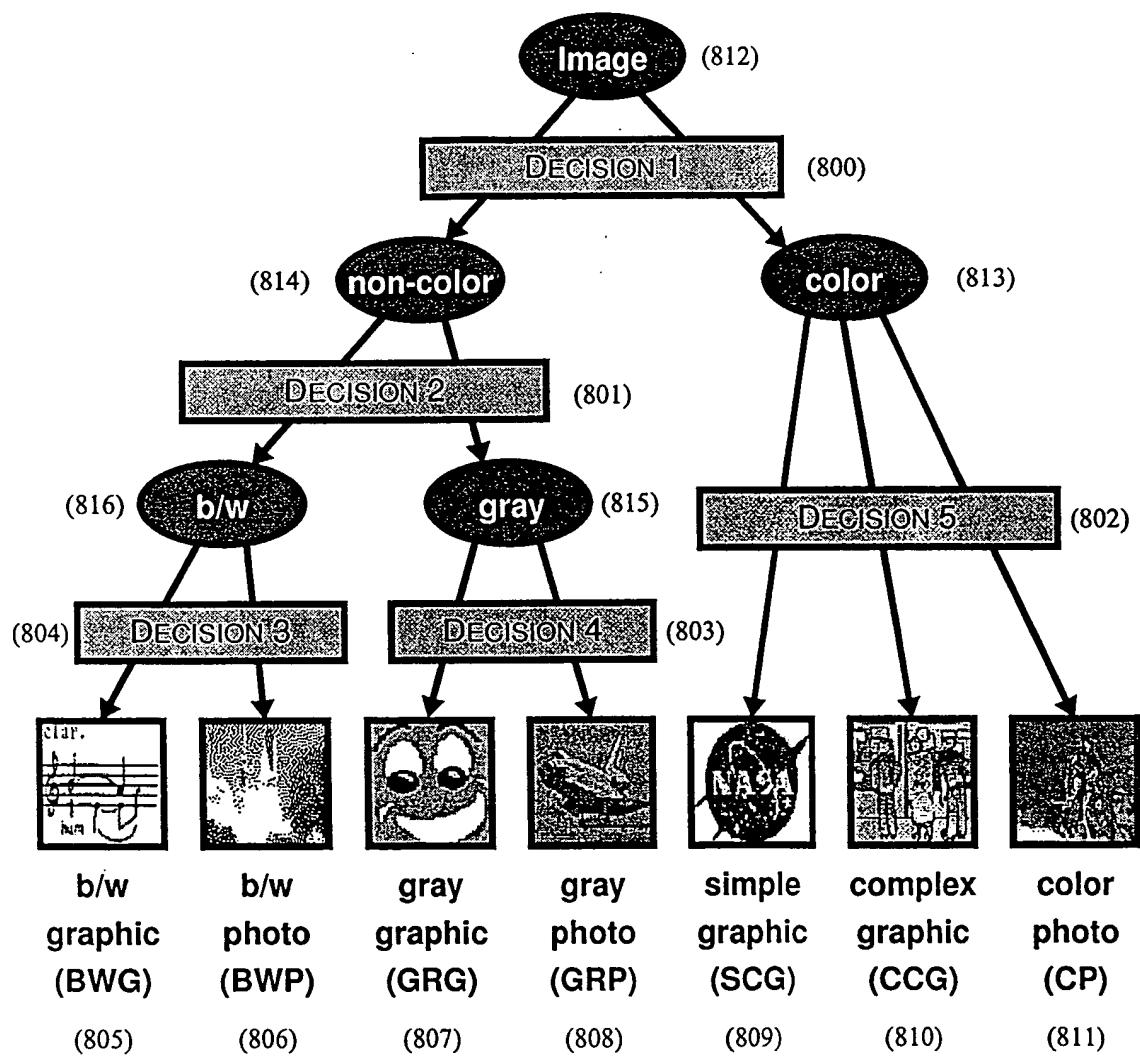
Figure 8: Image type decision tree consisting of five decision points for classifying the images into image type classes.
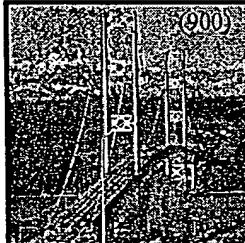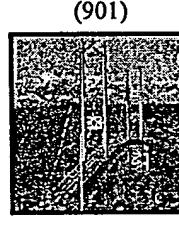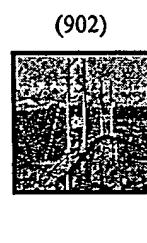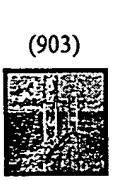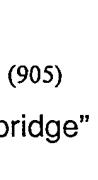
(906) Workstation	(907) Color PC	(908) TV browser	(909) HHC	(910) PDA	(911) Smart Phone
(900)	(901)	(902)	(903)	(904)	(905) "bridge"
size: 256 x 256	192 x 192	128 x 128	96 x 96	64 x 64	-
fidelity: 38 KB	23 KB	8 KB	4 KB	0.6 KB	100 B
color: 24 bit RGB	24 bit RGB	256 colors	4 bit gray	B/W	-

Figure 9: Image transcoding modifies the images along the dimensions of size, fidelity and color in order to adapt them to the client devices.
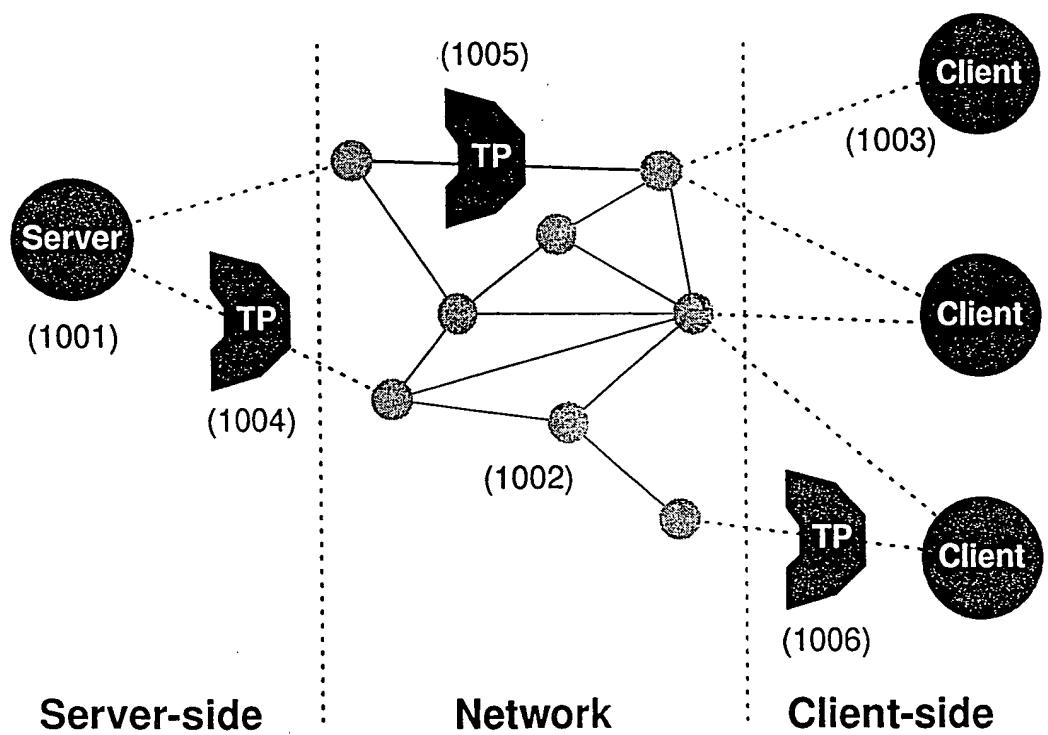
Figure 10: Deployment of transcoding proxies (TP) at the server, in the network and at the client for network-based transcoding of multimedia content.
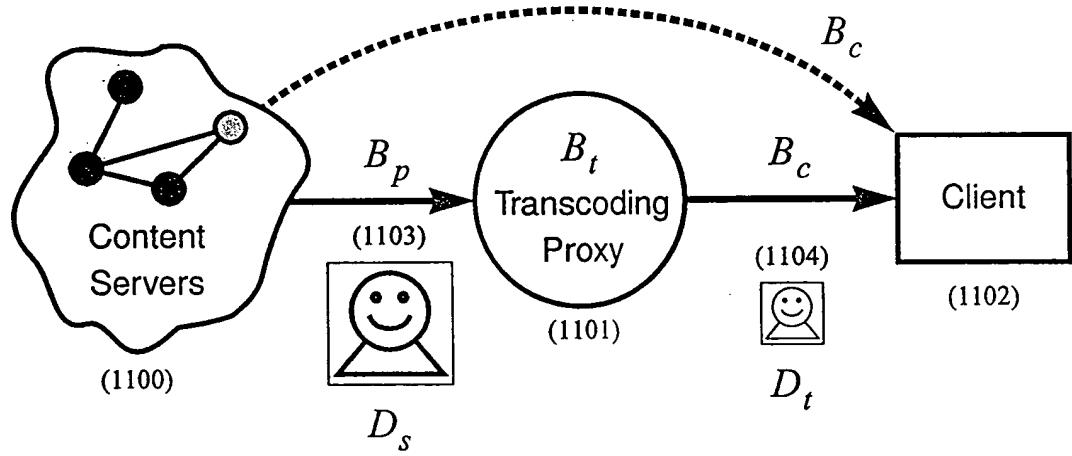
Figure 11: An image transcoding proxy analyzes, manipulates and transcodes images, on-the-fly, to adapt them to the capabilities of the client devices.
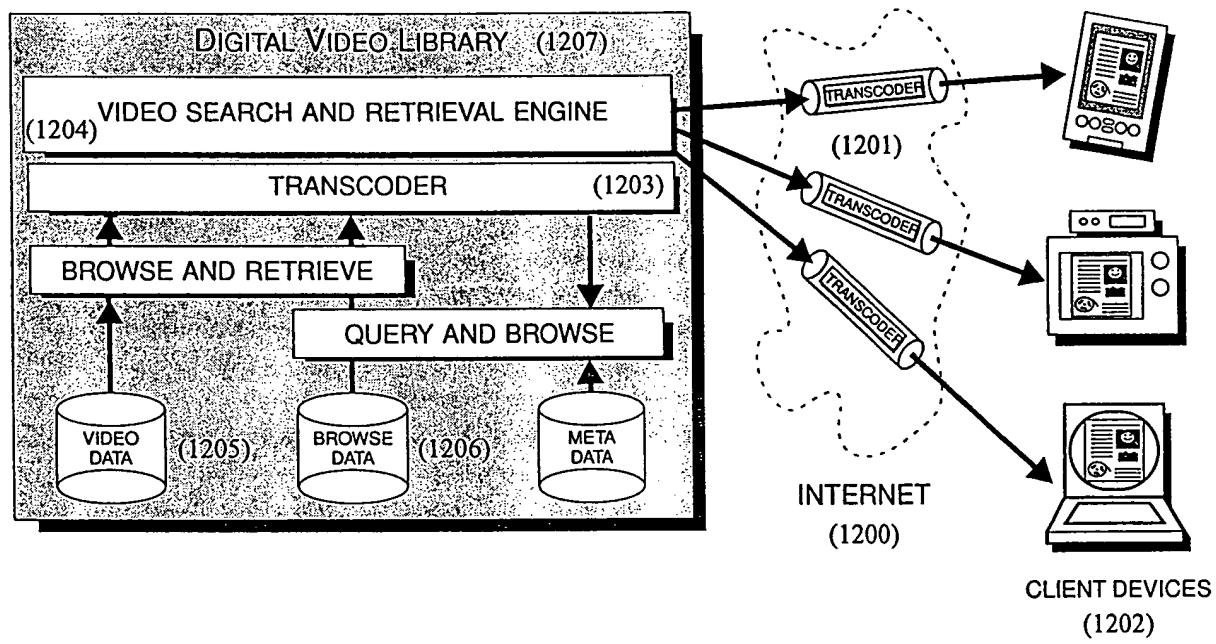
Figure 12: A video transcoding system can be deployed in the interface to a digital video library in order to provide universal access to client devices.